

WHAT IS CLAIMED IS:

1. A position detecting apparatus for detecting position of an object disposed in a first space by
5 receiving light from the object with a light receiving element disposed outside said first space, said position detecting apparatus comprising;

an optical system for directing light from the object to the light receiving element; and

10 a first optical element transmitting light from the object, disposed in said partitioning member for partitioning said first space and space outside said first space, wherein said first optical element is located on a position on or near a pupil plane or a
15 plane conjugate to the pupil plane of said optical system.

2. A position detecting apparatus according to claim 1, wherein said first optical element is located
20 on or near a pupil plane or a plane conjugate to the pupil plane which has a smallest effective diameter of light ray.

3. A position detecting apparatus according to claim 1, wherein said position near a pupil plane is
25 position between pupil plane and an at least one of closest optical element to the pupil plane on the image

side and closest optical element to the pupil plane on the object side of said optical system.

4. A position detecting apparatus according to
5 claim 1, wherein said position near a plane conjugate to the pupil plane is position between a plane conjugate to the pupil plane and an at least one of closest optical element to the plane conjugate to the pupil plane on the image side and closest optical
10 element to the plane conjugate to the pupil plane on the object side of said optical system.

5. A position detecting apparatus according to claim 1, wherein the pressure of said first space and
15 outside first space is different.

6. A position detecting apparatus that uses light to detect a position of an object, said position detecting apparatus comprising:
20 an optical element disposed on a partitioning member for partitioning two spaces having different pressures; and

a correction member for correcting an optical change caused by a deformation of said optical element.
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7. A position detecting apparatus according to claim 6, further comprising a detector, wherein said

first optical element is the closest optical element to said detector.

8. A position detecting apparatus according to
5 claim 6, wherein said optical element is a lens.

9. A position detecting apparatus according to claim 6, wherein said correction member is at least one of a parallel plate and a wedge optical member.

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10. A position detecting apparatus according to claim 6, further comprising a detector, located on an image surface of the object, for receiving the light from the object,

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wherein said correction member drives said detector, and corrects a positional offset on a plane perpendicular to an optical axis on an image surface of the object.

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11. A position detecting apparatus according to claim 6, wherein said correction member is located at a position that generates sensitivity similar to the optical change, and said correction member corrects at least one of coma and spherical aberration.

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12. A position detecting apparatus according to claim 6, wherein the optical change includes a

magnification, and said correction member includes a processor for correcting the magnification through processing.

5 13. A position detecting apparatus according to claim 6, further comprising a detector, located on an image surface of the object, for receiving the light from the object, wherein said correction member drives at least one of said detector and said object, and
10 corrects a shift of a focus position.

 14. A position detecting apparatus located across a first space and a second space that has a different pressure from that of the first space, said position
15 sensor using light to detect a position of an object that is located in the first space, said position sensor comprising:

 a detector, located in the second space, for receiving the light from the object;

20 a polarizer that defines a polarization direction of the light; and

 an optical element that transmits the light, partitions the first and second spaces, and is closer to said detector than said polarizer.

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15. A position detecting apparatus according to claim 14, wherein one of the first and second spaces is maintained vacuum or in a reduced pressure.

5 16. An exposure apparatus for exposing an object, said exposure apparatus comprising a position detecting apparatus used for an alignment or focusing of the object, said position detecting apparatus disposed in a first space by receiving light from the object with a
10 light receiving element disposed outside said first space, said position detecting apparatus comprising;
 an optical system for directing light from the object to the light receiving element; and
 a first optical element transmitting light
15 from the object, disposed in said partitioning member for partitioning said first space and space outside said first space, wherein said first optical element is located on a position on or near a pupil plane or a plane conjugate to the pupil plane of said optical
20 system.

17. A device fabricating method comprising the steps of:

 exposing an object using an exposure
25 apparatus; and
 developing the exposed object,

wherein said exposure apparatus includes a position detecting apparatus used for an alignment or focusing of the object, said position detecting apparatus disposed in a first space by receiving light
5 from the object with a light receiving element disposed outside said first space, said position detecting apparatus comprising;

an optical system for directing light from the object to the light receiving element; and

10 a first optical element transmitting light from the object, disposed in said partitioning member for partitioning said first space and space outside said first space, wherein said first optical element is located on a position on or near a pupil plane or a
15 plane conjugate to the pupil plane of said optical system.